433-RQMT-0002

GAMMA-RAY LARGE AREA SPACE TELESCOPE (GLAST)

SCIENCE SUPPORT CENTER FUNCTIONAL REQUIREMENTS DOCUMENT

December 16, 2002

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

GAMMA-RAY LARGE AREA SPACE TELESCOPE
(GLAST)

SCIENCE SUPPORT CENTER
FUNCTIONAL REQUIREMENTS DOCUMENT

December 16, 2002

NASA Goddard Space Flight Center

Greenbelt, Maryland

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FUNCTIONAL REQUIREMENTS DOCUMENT

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CHANGE RECORD PAGE

DOCUMENT TITLE: GLAST Science Support Center Functional Requirements Document

DOCUMENT DATE: December 16, 2002

ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Original	12/16/02	All	Baseline. CCR 433-0072.

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1 PURPOSE

This document defines the functional requirements that must be met by the GLAST Science Support Center (SCC).

The SSC is one of a number of organizations that constitute the GLAST ground operations system. The Mission Operations Center (MOC) will control the spacecraft by transmitting commands, and receiving the telemetry. The MOC will perform Level 0 processing, which removes transmission artifacts from the telemetry, and then will transmit these data to the other organizations. Each instrument team will maintain its own Instrument Operations Center (IOC) which will monitor the health of its instrument, take remedial action if necessary, perform the Level 1 processing, and support the instrument team's scientific studies. The two IOCs will transmit the Level 1 data and other data products to the SSC; the SSC will have a backup capability for performing Level 1 processing. The SSC and the IOCs will have joint responsibility for the definition of the relevant science analysis tools and for the representation of the instrument response functions; SSC scientists will participate in the development of the science tools. The SSC will be responsible for supporting the astronomical community's use of GLAST data by running the guest investigator (GI) program, providing analysis software and expertise, and disseminating GLAST data and results. The SSC will be responsible for the mission's timeline. Finally, the SSC will archive the mission's data.

This document first provides a list of acronyms (§2) and a glossary of key terms and concepts (§3). The relevant documents from which these requirements are derived are listed in §4. Finally, the actual requirements are presented (§5); traceability to the Mission System Specifcation (MSS) document is included. The appendices provide traceability and verification matricies.

2 ACRONYMS

ASDC	ASI Science Data Center
ASI	Agenzia Spaziale Italiana
DEC	Declination
EPO	Education and Public Outreach
GBM	GLAST Burst Monitor
GIOC	GBM IOC
GOF	Guest Observer Facility
GRB	Gamma-Ray Burst
GSFC	Goddard Space Flight Center
GI	Guest Investigator
HEASARC	High Energy Astrophysics Science Archive Research Center
HQ	Headquarters
IOC	Instrument Operations Center
LAT	Large Area Telescope
LHEA	Laboratory for High Energy Astrophysics
LIOC	LAT IOC
MOC	Mission Operations Center
MSS	Mission System Specification
NASA	National Aeronautics and Space Administration
NRA	NASA Research Announcement
OGIP	Office of Guest Investigator Programs
PI	Principal Investigator
RA	Right Ascension

SAA	South Atlantic Anomaly
SSC	Science Support Center
SWG	Science Working Group
TBD	To Be Determined
TBR	To Be Reviewed
TDRSS	Tracking and Data Relay Satellite System
TOO	Target of Opportunity

3 GLOSSARY

Analysis—Predicted performance using calculations to show compliance with specified performance (MSS §1.4).

Archive—A collection of data that the HEASARC maintains in perpetuity as a record of the mission and for the use of the scientific community.

Database—A collection of data that the SSC maintains for use by the SSC and the community it serves during the GLAST mission.

Demonstration—Observed compliance of functional operation or behavior with that specified (MSS §1.4).

Inspection—Visual proof of existence of specified characteristics or properties (MSS §1.4).

Level 0 data—The raw data from the spacecraft after the telemetry packets have been time-ordered and repeated packets from a given spacecraft downlink have been removed. The data streams from the spacecraft and the instruments are separated. The processing that produces Level 0 data is called Level 0 processing.

Level 1 data—Data from which many of the instrumental artifacts have been removed and that are ready for astrophysical data analysis. LAT Level 1 data consist of reconstructed events. The processing that produces Level 1 data is called Level 1 processing.

Level 2 data—The results of analysis of Level 1 data such as spectral fits and source detections. The processing that produces Level 2 data is called Level 2 processing.

Level 3 data—Compendia of Level 2 data.

Phase 0—The first 60 days after launch during which the spacecraft and instruments are turned on and checked out.

Phase 1—The first year of scientific operations after launch and checkout during which the spacecraft will survey the sky and the instrument teams will validate the data.

Phase 2—The mission after the conclusion of Phase 1 until the spacecraft leaves orbit or is turned off.

Test—Measurement of performance to show compliance with specified performance (MSS §1.4).

Verification—The process of proving that the implementation satisfies the requirement. The central question is whether the system is built right. The methods of showing

compliance with requirements are Inspection, Demonstration, Analysis and Test, as defined above (MSS §1.4).

4 APPLICABLE DOCUMENTS

- "GLAST Large Area Telescope Flight Investigation: An Astro-Particle Physics Partnership Exploring the High-Energy Universe," P. Michelson, PI.
- "GLAST Burst Monitor," C. Meegan, PI.
- NASA/DOE Memorandum of Understanding
- GLAST Level I Requirements Document
- Mission System Specification, 433-SPEC-0001
- Operations Concept Document, 433-OPS-0001
- Science Requirements Document, 433-SRD-0001
- Project Data Management Plan (PDMP), 433-PLAN-0009

5 REQUIREMENTS

5.1 General Requirements

High level requirements from the Mission Systems Specification apply to this document.

5.1.1 Launch Date

The design, development and operational readiness of the SSC shall meet the launch date specified on the master schedule for the project. (MSS §3.5.1.6)

5.1.2 Operational Lifetime

The operational lifetime of the SSC shall be the same as, or greater than, that of the spacecraft, which is a minimum of 5 years with a goal of 10 years, following an initial period of in-orbit checkout. (MSS §3.5.1.8)

5.1.3 Coordinate Systems

The SSC shall use the J2000 inertial coordinate system, using Right Ascension (RA) and Declination (DEC), as a standard means of identifying and reporting celestial objects and of communicating pointing directions. (MSS §3.5.1.10.1 and §3.5.1.10.2)

5.1.4 Units of Measurement

The SSC shall observe the current NASA policy directive, NPD 8010.2C, “Use of the Metric System of Measurement in NASA Programs.” Metric units shall be used with the following exceptions: angular measure may be expressed in degrees, minutes and seconds; photon and particle energy may be expressed in eV; and English units may be used for mechanical fabrication. (MSS § 3.5.1.12)

5.2 Facilities

5.2.1 Location

The SSC shall be part of the Office of Guest Investigator Programs (OGIP) within the Laboratory for High Energy Astrophysics (LHEA) at NASA’s Goddard Space Flight Center (GSFC). LHEA will provide the SSC with office space. The SSC will be mission-unique.

5.2.2 Network Security

The SSC shall be connected to the MOC and the IOCs by an intranet of wide area networks that is closed to, or protected from, public users of the external internet. (MSS §3.5.1.2)

5.2.3 Security of Information Technology

The SSC shall comply with NGP 2810.1 (http://nodis3.gsfc.nasa.gov/library/displayDir.cfm?Internal_ID=N_PG_2810_0001_&page_name=main).

5.2.4 Website Section 508 Compliance

The SSC website shall comply with federal Section 508 requirements using the HEASARC style guide (http://heasarc.gsfc.nasa.gov/docs/heasarc/Style_Guide/sec508.html).

5.3 Supporting the Guest Investigator (GI) Program

5.3.1 Development of the NASA Research Announcements (NRAs)

With the guidance of NASA HQ, the SSC shall write the NRAs along with the relevant supporting documents (e.g., mission plan, descriptions of the instruments, sensitivity tables). NASA HQ will establish the policies governing the NRA (e.g., regarding the number of TOOs allowed per cycle), and will revise, ratify and release the NRAs. The first NRA will be released approximately a year (TBR) before launch, and subsequent NRAs will be released annually.

5.3.2 Support of the Peer Selection Review

5.3.2.1 Tools for Preparing Proposals

The SSC shall provide software, sensitivity tables and other tools to assist with the preparation of the proposals.

5.3.2.2 Library of Previous Results

The SSC shall provide a library of previous results from GLAST and earlier gamma-ray missions.

5.3.2.3 Selection of Peer Review Panels

The SSC shall identify a pool of scientists from which NASA HQ will select the members of the peer review panels.

5.3.2.4 Implementation of Peer Review Policies

The SSC shall implement the policies promulgated by NASA HQ regarding the peer review process (e.g., regarding conflict-of-interest).

5.3.2.5 Convening the Peer Review

The SSC shall convene the peer review panels and shall provide logistical support.

5.3.2.6 Supporting NASA HQ in Selecting Guest Investigations

As requested, the SSC shall support NASA HQ in selecting the guest investigations and in determining the funding awarded to the selected investigations.

5.3.2.7 Administering the Guest Investigation Grants

The SSC shall administer the guest investigation grants through the appropriate GSFC grants office.

5.3.2.8 Posting the Selected Guest Investigations

The SSC shall post the list of selected guest investigations on its website. In addition to its intrinsic scientific interest, this list will inform investigators of the proprietary period for the selected investigations.

5.3.2.9 Scheduling the Guest Investigations

The SSC shall assist in scheduling the selected GI observations by supporting the establishment and maintenance of the timeline (see §5.4.1). (MSS §3.5.2.3)

5.3.3 Supporting the Guest Investigators

5.3.3.1 Providing GIs With Requested Data

The SSC shall make any requested data available to a GI within a day after the SSC receives them. The GIs will extract the data they requested from the SSC's databases. (MSS §3.1.2.6)

5.3.3.2 Providing GIs With Analysis Software

The SSC shall provide GIs with a comprehensive suite of analysis software and related documentation (see §5.5). (MSS §3.5.1.4)

5.3.3.3 Providing GIs with Assistance

The SSC shall respond to investigator's queries submitted electronically. These queries and the responses will be logged. (MSS §3.5.3.5)

5.4 Mission Support

5.4.1 Mission Schedule

5.4.1.1 GLAST Orbit Simulator

The SSC shall provide a tool to simulate GLAST observations to support timeline planning and to evaluate sky survey techniques for uniform coverage over various time frames, frequency of full sky coverage, and spacecraft feasibility.

5.4.1.2 Planning the Observing Timeline

The SSC shall convene and support the Timeline Committee that will plan the observing timeline for the mission. The Timeline Committee will consist of the Project Scientist (or his/her designee), SSC, LAT and GBM representatives, and mission operation experts (TBR). (MSS §3.5.2.3.)

5.4.1.3 Posting the Timeline

The timeline as implemented (for past observations) and as planned (for future observations) shall be posted on the SSC website. (MSS §3.5.3.5)

5.4.1.4 Activity Schedules

The SSC shall provide the MOC with activity schedules to implement the timeline. (MSS §3.1.4.2.1.3)

5.4.1.4.1 Backup Schedule during Phase 2

During Phase 2 both a primary and a backup schedule shall be provided. (MSS §3.1.4.2.1.3)

5.4.1.4.2 Earth Avoidance

Observing plans shall include default procedures that avoid having the earth enter the central field-of-view of the LAT. (MSS §3.1.4.2.2.2)

5.4.1.5 Targets of Opportunity

5.4.1.5.1 Support for TOO Decision

The SSC shall support the Project Scientist or his/her designee in evaluating requests for TOOs.

5.4.1.5.2 Implementing the TOO

When the Project Scientist or his/her designee declares a TOO, the SSC shall generate and transmit to the MOC an activity schedule giving celestial sky coordinates and an observing duration for such TOO targets. This schedule shall be forwarded to the MOC

within 2 hours of receipt of approval from the Project Scientist or his/her designee. The posted timeline will be updated (see §5.4.1.3). (MSS §3.5.2.7.2)

5.4.1.6 Command Flow

In this subsection "commands" refers both to the commands an IOC may send its instrument (e.g., to change a mode or a flight software parameter) and to flight software updates.

5.4.1.6.1 Command Flow Through the SSC

The SSC shall receive commands from the IOCs and transfer them to the MOC.

5.4.1.6.2 High Priority Commands

The SSC shall pass high priority commands (e.g., those necessary to preserve the instrument in an emergency) to the MOC immediately. For these commands the SSC will send the MOC a revised activity schedule to reflect changes to the timeline resulting from the implementation of these commands, and will update the posted timeline (see §5.4.1.3).

5.4.1.6.3 Scheduling Commands

The SSC shall schedule the implementation of all but the highest priority commands by appending to the commands a revised activity schedule before transferring the commands to the MOC. The posted timeline will be updated (see §5.4.1.3).

5.4.2 Public Information

The SSC shall post on its public website information related to the GLAST mission and its results for the support of GLAST-related research and for public information. (MSS §3.5.3.5)

5.4.3 Notifying the Investigator Community

The SSC shall notify the investigator community of important GLAST milestones such as the release of NRAs and the subsequent deadlines, of significant policy changes, and of major advances in the analysis software and techniques. This notification may include e-mail notices, e-mail newsletters, notices posted in the newsletters of appropriate professional organizations (e.g., in the newsletter of the High Energy Astrophysics Division of the AAS), and postings on the SSC website. (MSS §3.5.3.5)

5.4.4 Supporting the Project Scientist

The SSC shall support the Project Scientist by convening and providing logistical support for GLAST-related committee meetings and scientific conferences.

5.4.5 Supporting the Science Working Group (SWG)

The SSC shall support the SWG by reporting to it periodically, and acting on the action items assigned to SSC members. The SSC manager and science lead are ex officio members of the SWG.

5.4.6 Supporting the Users' Committee

The SSC shall support the Users' Committee logistically and scientifically.

5.5 Science Analysis Tools

5.5.1 Suite of Analysis Tools

The SSC shall provide investigators with a suite of science analysis tools to perform Level 2 processing on Level 1 data. A core suite of analysis tools for the LAT data has been defined by the LAT-SSC Software Working Group (http://www-glast.slac.stanford.edu/ScienceTools/tool_defs/). (MSS §3.5.1.4)

5.5.1.1 Single Analysis Environment

The SSC shall provide a single higher level analysis software environment for use by the scientific community and the instrument teams. (MSS §3.5.1.4)

5.5.1.2 Software Portability

The analysis tools shall be portable to standard operating systems. (MSS §3.5.1.5)

5.5.1.3 Vendor Independence

The analysis environment shall respect standards that ensure independence of vendor (i.e., users will be not required to purchase a particular software package to use the environment). (MSS §3.5.1.5)

5.5.1.4 Compatibility with Multi-mission Tools

The analysis environment shall respect standards that ensure compatibility with existing multi-mission high-energy astrophysics tools. (MSS §3.5.1.5)

5.5.2 Tool Documentation

Relevant documentation about the use, applicability and methodology of these tools shall be provided.

5.5.3 Tool Delivery

These tools and documentation shall be provided through the SSC's website; some tools will be run on the SSC's servers, while most tools will be retrieved by investigators over the internet, and run on the investigators' own servers. (MSS §3.5.3.5)

5.5.4 File Format

These tools shall conform to HEASARC standards regarding the use of FITS file formats and keywords (see http://heasarc.gsfc.nasa.gov/docs/heasarc/ofwg/ofwg_recomm.html and following links for these standards). This file standard will facilitate the application of multi-mission high energy astrophysics tools to the GLAST data. (MSS §3.5.1.5 and MSS §3.5.3.4)

5.5.5 Configuration Control

The science tools shall be maintained under configuration control within the GLAST project software infrastructure.

5.5.6 Tool Development

The definition, development and acceptance of the tools relevant to a given instrument shall be a joint SSC-instrument team responsibility. The SSC and the instrument teams have established software working groups to define the necessary tool suite (see §5.5.1) and to decide whether a software package conforms to the HEASARC standards (see §5.5.4), is scientifically valid, and is capable of running on investigators' computers. The result will be single analysis environment for both the scientific community and the instrument teams (see §5.5.1.1). (MSS §3.5.1.4)

5.5.7 Instrument Response Functions

Through the SSC-IOC software working groups the SSC shall participate in defining the representation of the instrument response functions (IRFs), determining that they conform to HEASARC standards (see §5.5.4), and ensuring that they can be used by the scientific community unaffiliated with the instrument teams. The instrument teams will be responsible for calibrating their instruments and creating the IRFs.

5.6 Standard Processing

5.6.1 Standard High Level Data Products

The SSC shall perform the production data processing that is necessary to generate standard high-level data products, as defined in §5.6.4. (MSS §3.5.2.6)

5.6.2 Data Processing Rate

The SSC shall be capable of processing its standard data products at a rate greater than 4 times the rate at which the data are accumulated, permitting rapid reprocessing of the data, should it be necessary.

5.6.3 Processing Schedule

The SSC shall complete processing data and make the results of this processing available within 24 hours of the SSC's receipt of the data.

5.6.4 Web Page Product Generation

The SSC shall provide, on a regular basis, standard products to be linked to the SSC's website. (MSS §3.5.2.6 and MSS §3.5.3.5) These include:

- LAT all-sky maps
- Expanded LAT maps of special regions such as 3C279/3C273 and the Galactic anti-center
- Exposure maps for the same regions
- Crab pulse profile and pulse-phase images using LAT and GBM data
- GRB localizations and time profiles for ~10 (TBD) strong GRBs per year from LAT and GBM data
- Lightcurves for a number of strong sources (e.g., 3C 273).

5.6.5 Level 1 Processing Pipeline

The SSC shall maintain backup Level 1 processing pipelines, which will be operated only with the concurrence and supervision of the relevant instrument team. Members of the SSC will be familiar with the methodology and operation of these pipelines.

5.7 Databases and Archives

In the following "database" refers to a collection of data that the SSC maintains for use by the SSC and the community it serves during the GLAST mission, while "archives" refers to a collection of data that the HEASARC maintains in perpetuity as a record of the mission and for the use of the scientific community. The standard architecture of HEASARC archives is a set of "archive" files, in FITS format, with the actual data, and "database tables" (which may be maintained within a database system) describing the data. In some cases the same files will constitute both the SSC's databases and the HEASARC's archives.

5.7.1 Data Transmission

The SSC shall receive data products from the MOC, LIOC or GIOC as follows: the provider will send the SSC a manifest of available data files, and then the SSC shall get (e.g., by FTP) the files from the provider's server. The SSC will inform the provider that the files have been received satisfactorily after applying error detection techniques; corrupted data will be retransmitted. (MSS §3.5.1.11) The data products will be described in the relevant Interface Control Documents.

5.7.2 The SSC Databases

The SSC shall maintain the data products received from the MOC, LIOC or GIOC, as well as data products it creates, in databases. The SSC will also maintain data from ground tests that are in the format of flight telemetry, as agreed upon with the instrument teams. (MSS §3.5.2.10 and MSS §3.5.2.11)

5.7.3 Location of Databases

The SSC's databases shall reside on data storage devices physically connected to the HEASARC computer system. (MSS §3.5.2.10, MSS §3.5.2.11, and MSS §3.5.3.4)

5.7.4 Access to Databases During Mission

During the mission the SSC shall make these databases accessible to the scientific community through the SSC website in accordance with the mission's data policies. (MSS §3.1.2.6, MSS §3.5.2.10, and MSS §3.5.3.5)

5.7.4.1 Data Rights Policy Implementation

The SSC shall implement the data rights policies described in the Project Data Management Plan.

5.7.4.2 Data Extraction Tools

The SSC shall provide the tools necessary to search and extract data from these databases. The extraction tools are part of the comprehensive suite of analysis software the SSC will provide the scientific community (see §5.3.3.2, §5.5.1). The resulting data will be supplied in a format conforming to OGIP standards (e.g., as FITS files). The SSC user interfaces will not require knowledge of the internal file structures, naming conventions, or data structure but will be invoked using commonly accepted parameters for absolute time, elapsed time, position (in a TBD variety of coordinate systems) and energy. (MSS §3.5.2.10)

5.7.4.3 Delivery of Data to the ASDC

The SSC shall provide the Agenzia Spaziale Italiana (ASI) Science Data Center (ASDC) with the data products necessary for the ASDC to mirror selected SSC databases, along with the software to analyze these data, as described by the NASA/ASI Memorandum of Understanding. The data products that will be given the ASDC include the LAT event summary data, the response functions, the pointing and livetime history, the interstellar emission model, and pulsar ephemerides. The delivery method is TBD.

5.7.5 Data Archives

By the time it is disbanded after the end of the GLAST mission, the SSC shall have transferred responsibility for managing the GLAST archive to the HEASARC. In the HEASARC's preferred format at the time of transfer, these data will constitute the GLAST permanent archives. (MSS §3.5.2.10, MSS §3.5.2.11, and MSS §3.5.3.4)

5.7.6 Software Archives

By the end of the mission, the SSC shall deliver all software and documentation to the HEASARC. The software will have the same functionality whether utilizing data from the SSC's operational databases or the HEASARC's archives (MSS §3.5.2.10 and MSS §3.5.3.4)

APPENDIX A—TRACEABILITY MATRIX

Requirement	Mission System Specification Parent Requirement
5.1.1	MSS 3.5.1.6
5.1.2	MSS 3.5.1.8
5.1.3	MSS 3.5.1.10.1, MSS 3.5.1.10.2
5.1.4	MSS 3.5.1.12
5.2.1	Derived
5.2.2	MSS 3.5.1.2
5.2.3	Derived
5.2.4	Derived
5.3.1	Derived
5.3.2.1	Derived
5.3.2.2	Derived
5.3.2.3	Derived
5.3.2.4	Derived
5.3.2.5	Derived
5.3.2.6	Derived
5.3.2.7	Derived
5.3.2.8	Derived
5.3.2.9	MSS 3.5.2.3
5.3.3.1	MSS 3.1.2.6
5.3.3.2	MSS 3.5.1.4
5.3.3.3	MSS 3.5.3.5
5.4.1.1	Derived
5.4.1.2	MSS 3.5.2.3
5.4.1.3	MSS 3.5.3.5
5.4.1.4	MSS 3.1.4.2.1.3
5.4.1.4.1	MSS 3.1.4.2.1.3
5.4.1.4.2	MSS 3.1.4.2.2.2
5.4.1.5.1	Derived
5.4.1.5.2	MSS 3.5.2.7.2
5.4.1.6.1	Derived
5.4.1.6.2	Derived
5.4.1.6.3	Derived
5.4.2	Derived
5.4.3	Derived
5.4.4	Derived
5.4.5	Derived
5.4.6	Derived
5.5.1	MSS 3.5.1.4
5.5.1.1	MSS 3.5.1.4
5.5.1.2	MSS 3.5.1.5

Requirement	Mission System Specification Parent Requirement
5.5.1.3	MSS 3.5.1.5
5.5.1.4	MSS 3.5.1.5
5.5.2	Derived
5.5.3	MSS 3.5.3.5
5.5.4	MSS 3.5.1.5, MSS 3.5.3.4
5.5.5	Derived
5.5.6	MSS 3.5.1.4
5.5.7	Derived
5.6.1	MSS 3.5.2.6
5.6.2	Derived
5.6.3	Derived
5.6.4	MSS 3.5.2.6, MSS 3.5.3.5
5.6.5	Derived
5.7.1	MSS 3.5.1.11
5.7.2	MSS 3.5.2.10, MSS 3.5.2.11
5.7.3	MSS 3.5.2.10, MSS 3.5.2.11, MSS 3.5.3.4
5.7.4	MSS 3.1.2.6, MSS 3.5.2.10, MSS 3.5.3.5
5.7.4.1	Derived
5.7.4.2	MSS 3.5.2.10
5.7.4.3	Derived
5.7.5	MSS 3.5.2.10, MSS 3.5.2.11,MSS 3.5.3.4
5.7.6	MSS 3.5.2.10, MSS 3.5.3.4

APPENDIX B—VERIFICATION MATRIX

The definitions of analysis, demonstration, inspection and test are provided in the Glossary (§3).

Requirement	Verification Method
5.1.1	Inspection
5.1.2	Demonstration
5.1.3	Inspection
5.1.4	Inspection
5.2.1	Inspection
5.2.2	Inspection
5.2.3	Test
5.2.4	Test
5.3.1	Demonstration
5.3.2.1	Inspection
5.3.2.2	Inspection
5.3.2.3	Demonstration
5.3.2.4	Inspection
5.3.2.5	Demonstration
5.3.2.6	Demonstration
5.3.2.7	Demonstration
5.3.2.8	Inspection
5.3.2.9	Demonstration
5.3.3.1	Analysis
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5.3.3.3	Demonstration
5.4.1.1	Inspection
5.4.1.2	Demonstration
5.4.1.3	Demonstration
5.4.1.4	Demonstration
5.4.1.4.1	Demonstration
5.4.1.4.2	Analysis
5.4.1.5.1	Demonstration
5.4.1.5.2	Test
5.4.1.6.1	Test
5.4.1.6.2	Test
5.4.1.6.3	Test
5.4.2	Demonstration
5.4.3	Demonstration
5.4.4	Demonstration
5.4.5	Demonstration
5.4.6	Demonstration
5.5.1	Inspection
5.5.1.1	Inspection

Requirement	Verification Method
5.5.1.2	Test
5.5.1.3	Inspection
5.5.1.4	Inspection
5.5.2	Inspection
5.5.3	Test
5.5.4	Inspection
5.5.5	Inspection
5.5.6	Demonstration
5.5.7	Demonstration
5.6.1	Test
5.6.2	Test
5.6.3	Test
5.6.4	Inspection
5.6.5	Test
5.7.1	Test
5.7.2	Inspection
5.7.3	Inspection
5.7.4	Demonstration
5.7.4.1	Inspection
5.7.4.2	Inspection
5.7.4.3	Inspection
5.7.5	Inspection
5.7.6	Inspection